CLAIMS

Inventor , Launeil Neil Sanders, claim:

CLAIM 1- Raw influent treatment processes with chemical coagulation, chemical flocculation, solids agglomeration and flocculation , and chemical precipitation and solids removal the inventor claims enhanced BOD, Biological Oxygen Demand , COD, Chemical Oxygen Demand , TOC , Total Organic Carbon and COLOR , Platinum Cobalt Standardized Color units , removals across primary clarifier(s) ;
(a) adding to raw influent a commercially available flocculant and/or polymers in achieving 75% to 95% electrical energy savings in ASB's , Activated sludge and all other aeration systems with elimination of secondary biological treatment .

CLAIM 2-

A raw influent treatment process eliminating secondary biological treatment comprising:

a) adding to raw influent a commercially available alum solution ;

b) adding the commercially available chemicalflocculants for coagulation, chemical flocculation, solids agglomeration and flocculation , and chemical precipitation and solids removal the inventor claims 95% reduction and removal efficiencies at primaryclarifiers(s) for all said four pollutants BOD, Biological Oxygen Demand , COD, Chemical Oxygen Demand , TOC , Total Organic Carbon and COLOR , Platinum Cobalt Standardized Color units.

CLAIM 3- That with the Old Art/ Old Fields of Invention the following pollutant parameters COD, TOC , and COLOR go through the Old Biological Systems Unchanged; therefore there is Zero per cent reduction/ removals for these said three pollutants across all devices in Old Art/ Old Fields of Invention prior to discharge to stream whereas said new invention and New Technology- "Toxics ,Organic, Color Removal Technology Process /or Method For Toxicities, Organic, Color Reduction of All Pulp/Paper Mills' Wastewater" removes 95% for each of said four pollutants across Device A at stream 2 alone.

REDUNDANT TO CLAIM 2 - DELETED

CLAIM 4- That with the Old Art/ Old Fields of Invention Old Art /Biological Aeration Systems which includes aerated stabilization basins, lagoons, activated sludge, or any other devices where mechanical air or oxygen is inserted(Device B) that there is no biological degradation across Device B and that only the negatively charged particles are changed from negative anions state somehow unknown with the aeration ,but the toxicities, organic loading is unchanged across the said aeration systems as the COD , TOC, and COLOR

constitute that no biodegradation, destruction has occurred comprising: Whereas said new invention and New Technology Process /or Method fully protects the public, aquatic life, human health and Loop-Holes in current Law have to be amended by U.S. EPA Administrator and all 50 states regulatory agencies by revising permits to include pollutant parameters COD, TOC , and COLOR ; Old Art/Old Fields of Lime & other Color Removals were thought to be cost prohibitive as the premise was cost of chemicals at Device A plus the extended biological aeration was required; however this is a myth which is proven & revealed in said new invention and New Technology.

At stream #3, exiting Device B,

Pollutant Parameter:

Concentrations in Discharge Effluent (in milligrams per liter)[COLOR in mu]

	"Old Biological Technology"	New Technology By InventorLienal Sanders {Note 1}
BOD5	60-90	40-60
COD	250-400	40-65
TOC	150-300	40-65
COLOR	1000- 4000	100-250

Note1- With New Technology, the above concentrations for COD, TO, and COLOR also are same exiting Device A as proves no aeration is required. BOD, COD, TOC concentrations are in milligrams per liter , and COLOR is in Platinum-Cobalt units ofmu.

REDUNDANT TO CLAIMS 1 & 2 - DELETED

CLAIM 5- That with the Old Art/ Old Fields of Invention in that various Color Removals by addition of lime and other coagulants back in 70's , 80's and early 90's are still Old Art/Fields in that these Old Color Removals of Lime Treatment and all other Coagulant Color Removals were deficient from Inventor Launeil Sanders' said new invention and New Technology Process as they were and still are deficient as they assumed biological treatment through aeration systems was additionally required.

REDUNDANT TO CLAIMS 1 & 2 - DELETED

CLAIM 6- That said new invention and New Technology- "Toxics ,Organic, Color Removal Technology Process /or Method For Toxicities, Organic, Color Reduction of All Pulp/Paper Mills' Wastewater" contains a Regenerative Chemicals System as shown in Device E whereas approx 35% regeneration is achieved and recycled via stream 6 to the inlet of stream 1 which is inlet to Device A.

REDUNDANT TO CLAIM 15 , (f) - DELETED

CLAIM 7- That the chemicals conveyed in stream 6 are added automatically from Device D and may consist of any and/or combination of the following chemicals aluminum chloride [AlCl .sub.3] as this is commercial grade liquid solution approx 20 -30%; , Commercial Alum which is liquid aluminum sulfate(17 %commercial liquid solution) [Al .sub .2 (SO.sub.4).sub.3 }; Ferric Chloride which is liquid solution [FeCl.sub.3]; and Ferric Sulfate which is liquid solution [Fe.sub.2 (SO.sub.4).sub3]; Ferrous Sulfate which is liquid solution [Fe.sub.3. (SO.sub.4).sub3] comprising that the chemicals are added at influent at stream 1 of said new invention and New Technology. CLAIM 8- That with chemical coagulation, chemical flocculation, solids agglomeration and flocculation , and chemical precipitation and solids removal the inventor claims that this said New Technology Process/or Method becomes BACT (Best Economically Achievable Technology) for Adsorbable Organic Halogens (AOX) and Dioxins.

SAME , REDUNDANT TO CLAIM 15 - DELETED

CLAIM 8- That with chemical coagulation, chemical flocculation, solids agglomeration and flocculation , and chemical precipitation and solids removal the inventor claims that this said New Technology by Inventor Colonel Launeil Sanders also becomes BACT (Best Economically Achievable Technology) forAdsorbable Organic Halogens (AOX) and Dioxins .

This claim is DELETED ; AS U.S. EPA has deemed various technologies that can achieve the very high removal efficiencies . Thus, this claim ismis-nomer and shall be deleted .

CLAIM 9- That with chemical coagulation, chemical flocculation, solids agglomeration and flocculation , and chemical precipitation and solids removal the inventor claims an Automated Controller System as shown in Device C which will and does automatically control the optimum amount of all chemicals while measurement and accounting of chemicals from Regenerative Chemicals System as shown in Device E.

This claim was describing the Continuous pH Controller System , whereas legal prosecuting procedure is implemented and this is REDUNDANT TO CLAIM 15 - thus CLAIM 9 IS DELETED

CLAIM 10 - That with chemical coagulation, chemical flocculation, solids agglomeration and flocculation , and chemical precipitation and solids removal the inventor claims that the solids generated are non-hazardous, and that the approx 15-25% of solids are wasted (because of inert inorganic ash content) in the Sludge Conditioning /Wasting Device M as non-hazardous wastes shown in stream 15.

SAME AS CLAIM 6 WHEREAS IS REDUNDANT TO CLAIM 15 , (f) -
THUS THIS CLAIM 10 IS DELETED

CLAIM 11- That with the Old Art/ Old Fields of Invention there were requirements for large Holding Ponds(lakes) Device G because of low flow, 7 Day Q 10 's , in the receiving streams ; whereas said new invention and New Technology Process fully eliminates any need nor requirement to construct 1,500,000,000 holding lakes /or larger as what occurred at the Boise Southern , DeRidder, Louisiana mill or Bowater's Catawba, S.C. mill and fully saves future mills from these huge capital investments and increases treatment plant capacity.

SAME , Covered in claims 1 , 2, and 15 AS CLAIM 6 WHEREAS IS REDUNDANT TO these said claims - THUS THIS CLAIM 11 IS DELETED

CLAIM 12- That with chemical coagulation, chemical flocculation, solids agglomeration and flocculation , and chemical precipitation and solids removal the inventor claims automatic process analyzer Device H at the influent stream 1 which will have alarm and will automatically alert operators of specific spills that require immediate corrective actions.

Here , we have Continuous COD Analyzer which is Covered in claims 15 , (d) AS CLAIM 12 WHEREAS IS REDUNDANT TO these said claims - THUS THIS CLAIM 12 IS DELETED

CLAIM 13- That said new invention and New Technology Process /or Method contains and comprises the treatment of all pulp and paper mills' raw influent wastewater as due to fact mills raw influent may range from 3 million gallons per day (MGD) to 70 MGD and mills capital investment sewer systems route all wastes to primary clarifier [as shown in Device A, stream 1] in Figure 1 this is only cost effective way; no segregation is required and this was developed on pulping wastes, groundwood pulping, thermomechanical pulping, bleach plant wastes consisting of chlorine, hypochlorite, caustic extraction, lime kiln , recovery boilers, power boilers , utilities, paper machines as this integrated mill produced 1150 TPD (tons per day) of kraft linerboard and 1070 TPD of newsprint (2 machines) with each newsprint machine rated at 535 TPD of newsprint.

SAME , Covered in claims 1 , 2, and 15 AS CLAIM 13 WHEREAS IS REDUNDANT TO these said claims - THUS THIS CLAIM 13 IS DELETED

CLAIM 14- That said precipitated solids have to be removed from system (some Old Art/Old Fields re-dissolve precipitates at very low pH's with acids; however this is detrimental and a difference of New Invention) whereas underflow precipitated solids fromclarifier Device A flow via stream 4 to the Regenerative Chemicals System as shown in Device E whereas existingdewatering equipment and said Device E are utilized to remove solids, but some flocculated coagulants are recycled via stream 6 to the inlet of stream 1 which is inlet to Device A.

SAME , Covered in claims 1 , 2, and 15 AS CLAIM 14 WHEREAS IS REDUNDANT TO these said claims - THUS THIS CLAIM 14 IS DELETED

CLAIM 15- A raw influent treatment process eliminating secondary biological treatment comprising:
a) adding to raw influent a commercially available alum solution ;
b) adding to raw influent a commercially available alum solution with addition being continuously controlled by continuous in-line pH controller to pH of 5.7 to 6.0 ;
c) adding to raw influent from about 0.25 to 3.0 parts per million of a nonionic , cationic or anionic commercial polyelectrolyte polymer to increase settling rate , agglomeration , and effectiveness of sedimentation and increase Color , Chemical Oxygen Demand , and Total Organic Carbon removal efficiencies producing a supernatant liquid layer from which the color bodies and 95% oforganics are removed ;
d) monitoring and controlling the Color , Chemical Oxygen Demand , and Total Organic Carbon removal efficiencies across the primaryclarifier(s) by insertion of Continuous in-line Chemical Oxygen Demand Analyzer at outlet of primaryclarifier(s) ;
e) separating the supernatant liquid layer from which the color bodies andorganics have been removed ;

f) removing the sludge from primaryclarifier(s) underflow , dewatering the sludge , incineration in existing bark power boilers or other incineration , regeneration and the recycle of a portion of recovered chemicals , and wasting of sludge up to approximately 20% to 35% depending on content of inert boiler ash in raw influent which consists of adding cationic , anionic or non-ionic polymers indewatering;
g) that supernatant liquid layer passes on to other final polishing /pH adjustment , if needed , and since Chemical Oxygen Demand , Total Organic Carbon , and Color removal efficiencies are exceedingly high , greater than 95% , no biological treatment is required and secondary biological treatment is eliminated;

CLAIM 16- A raw influent treatment process eliminating secondary biological treatment according to claim 15 comprising:

a) adding to raw influent a commercial aluminum chloride liquid solution ;

b) adding to raw influent a commercial aluminum chloride liquid solution with addition being continuously controlled by continuous in-line pH controller to a pH of 5.7 to 6.0 ;

CLAIM 17- A raw influent treatment process eliminating secondary biological treatment according to claim 15 comprising:

a) adding to raw influent a commercial ferric chloride liquid solution ;

b) adding to raw influent a commercial ferric chloride liquid solution with addition being continuously controlled by continuous in-line pH controller to a pH of 5.7 to 6.0 ;

CLAIM 18- A raw influent treatment process eliminating secondary biological treatment according to claim 15 comprising:

a) adding to raw influent a commercial ferrous sulfate solution ;

b) adding to raw influent a commercial ferrous sulfate solution with addition being continuously controlled by continuous in-line pH controller to a pH of 5.7 to 6.0 ;

CLAIM 19- A raw influent treatment process eliminating secondary biological treatment according to claim 15 comprising:

a) adding to raw influent a commercial ferrous sulfate solution and sulfuric acid ;

b) adding to raw influent a commercial ferrous sulfate solution and sulfuric acid with addition being continuously controlled by continuous in-line pH controller to a pH of 5.7 to 6.0 ;

CLAIM 20- A raw influent treatment process eliminating secondary biological treatment according to claim 15 comprising:

a) adding to raw influent the desired reagent chemicals to the desired pH of 5.7 to 6.0 delivers a primary clarifier(s) effluent with 40 to 65 milligrams per liter of Chemical Oxygen Demand , 40 to 65 milligrams per liter of Total Organic Carbon , and 100 to 250 milligrams per liter of Color respectively. b) that in other old art it was noted that conventional biological treatment was required whereas in this invention no secondary treatment is required and directly results in approximately 100% elimination of aerators' horsepower and maintenance which results in economic electrical energy savings to the Pulp and Paper industry .

CLAIM 21- A raw influent treatment process eliminating secondary biological treatmenwhich comprises contacting raw influent containing lignins , lignin degradation productshumic acids , sulphates(ites) attached to ring structures , cellulose fibers , cooking chemicals and like from pulping , lime kiln , bleach plants including chlorine hypochlorite , caustic extraction , chlorine dioxide stages groundwood pulping , thermomechanical pulpingamd all like in combined raw influent sewer :

a) adding to raw influent the barium chloride and mixture of hydrochloric acid reagent chemicals to the desired pH of 5.7 to 6.0 ;

b) adding to combined raw influent the barium chloride and hydrochloric acid reagents with addition being continuously controlled by continuous in-line pH controller to a pH of 5.7 to 6.0 ;

c) adding to raw influent from about 0.25 to 3.0 parts per million of a nonionic , cationic or anionic commercial polyelectrolyte polymer to increase settling rate , agglomeration , and effectiveness of sedimentation and increase Color , Chemical Oxygen Demand , and Total Organic Carbon removal efficiencies producing a supernatant liquid layer from which the color bodies and 95% oforganics are removed ;

d) monitoring and controlling the Color , Chemical Oxygen Demand , and Total Organic Carbon removal efficiencies across the primaryclarifier(s) by insertion of Continuous on-line Chemical Oxygen Demand Analyzer at outlet of primaryclarifier(s) ;

e) separating the supernatant liquid layer from which the color bodies andorganics have been removed ;

f) removing the sludge from primaryclarifier(s) underflow , dewatering the sludge , incineration in existing bark power boilers or other incineration , regeneration and the recycle of a portion of recovered chemicals , and wasting of sludge up to approximately 20% to 35% depending on content of inert boiler ash in raw influent which consists of adding cationic , anionic or non-ionic polymers indewatering ;

g) that supernatant liquid layer passes on to other final polishing and since Chemical Oxygen Demand , Total Organic Carbon , and Color removal efficiencies are exceedingly high , greater than 95% , no biological treatment is required and secondary biological treatment is eliminated ;

CLAIM 22- A raw influent treatment process eliminating secondary biological treatment which comprises contacting raw influent containing lignins , lignin degradation productshumic acids , sulphates(ites) attached to ring structures , cellulose fibers , cooking chemicals and like from pulping , lime kiln , bleach plants including chlorinehypochlorite , caustic extraction , chlorine dioxide stages groundwood pulping ,thermomechanical pulpingamd all like in combined raw influent sewer :

a) adding to raw influent the barium sulfide liquid , borax , sodium silicate liquid mixture reagent chemicals to the desired pH of 5.5 to 6.0 ;

b) adding to combined raw influent the barium sulfide liquid , borax , sodium silicate liquid mixture reagent chemicals with addition being continuously controlled by continuous in-line pH controller to a pH of 5.5 to 6.0 ;

c) adding to raw influent from about 0.25 to 3.0 parts per million of a nonionic , cationic or anionic commercial polyelectrolyte polymer to increase settling rate , agglomeration , and effectiveness of sedimentation and increase color , Chemical Oxygen Demand , and Total Organic Carbon removal efficiencies producing a supernatant liquid layer from which the color bodies and 95% of organics are removed ;

d) monitoring and controlling the color , Chemical Oxygen Demand , and Total Organic Carbon removal efficiencies across the primary clarifier(s) by insertion of Continuous in-line Chemical Oxygen Demand Analyzer at outlet of primary clarifier(s) ;

e) separating the supernatant liquid layer from which the color bodies and organics have been removed ;

f) removing the sludge from primary clarifier(s) underflow , dewatering the sludge , incineration in existing bark power boilers or other incineration , regeneration and the recycle of a portion of recovered chemicals , and wasting of sludge up to approximately 20% to 35% depending on content of inert boiler ash in raw influent which consists of adding cationic , anionic or non-ionic polymers in dewatering ;

g) that supernatant liquid layer passes on to other final polishing/pH adjustment , if needed , and since Chemical Oxygen Demand , Total Organic Carbon , and Color removal efficiencies are exceedingly high , greater than 90% , no biological treatment is required and secondary biological treatment is eliminated;

CLAIM 23- A raw influent treatment process eliminating secondary biological treatment which comprises contacting raw influent containing lignins , lignin degradation products , humic acids , sulphates (ites) attached to ring structures , cellulose fibers , cooking chemicals and like from pulping , lime kiln , bleach plants including chlorine , hypochlorite , caustic extraction , chlorine dioxide stages , groundwood pulping , thermomechanical pulping and all like in combined raw influent sewer according to claim 1 , comprising :

a) removing all organics , color bodies and Chemical Oxygen Demand materials across primary clarifiers ;

b) removing organics , color bodies and Chemical Oxygen Demand materials across primary clarifiers with in-line continuous pH controller adjusting to pH 5.7 to 6.0 ;

c) removing organics , color bodies and Chemical Oxygen Demand materials across primary clarifiers results in 95% removal efficiencies for Chemical Oxygen Demand , Total Organic Carbon , and color bodies whereas existing actual data from Bowater and International Paper , Figure 2 , the wastewater goes through aeration biological systems unchanged in degradation of organics , Chemical Oxygen Demand materials ; whereas

d) that Bowater influent concentrations , outlet primaryclarifier concentrations , and outlet of aerated secondary biological aeration were the same (no change) at 795 milligrams per liter of Chemical Oxygen Demand , 368 milligrams per liter of Total Organic Carbon , and 2820 milligrams per liter of Color with no biodegradation and no biological oxidation across existing secondary aeration systems ; whereas

e) in existing Boise Southern , DeRidder , Louisiana , raw influent for which 280 raw influent samples treated as in and according to claim 1 , claim 2 , claim 3 , claim 4 and claim 5 resultant was 95% removal of BOD , COD , TOC , and Color ; whereas

f) in existing Boise Southern ,DeRidder , Louisiana , raw influent Biological Oxygen Demand of 235 milligrams per liter was immediately reduced by chemicals treatment to 40 milligrams per liter Biological Oxygen Demand and subsequent 95% organic reductions were achieved ;

g) furthermore in existing Boise Southern , DeRidder , Louisiana , raw influent if you can add reagent chemicals here and immediately get 90% Biochemical Oxygen Demand which is in what it takes you to obtain in 23 days retention time across the aerated stabilization basin , question of is there any biological degradation taking place ? ;

h) only that since pulping and paper operations results in configuring negative electrical charges on the lignins and other lignin ringed compounds , it is more than likely these electrical charges that are measured by the Biochemical Demand Test , the great fakery , fraud of the Biochemical Oxygen Demand test ;

i) furthermore the Biochemical Oxygen Demand Test is defective and insertion of Continuous in-line Chemical Oxygen Demand Analyzer exiting primaryclarifiers is required ;

j) secondary biological oxygen treatment is eliminated as nobiodegradation takes place , no bugs are living degrading any organic bodies .

CLAIM 24 - A raw influent treatment process eliminating secondary biological treatment which comprises contacting raw influent containing lignins , lignin degradation productshumic acids , sulphates(ites) attached to ring structures , cellulose fibers , cooking chemicals and like from pulping , lime kiln , bleach plants including chlorinehypochlorite , caustic extraction , chlorine dioxide stagesgroundwood pulping , thermomechanical pulpingamd all like in combined raw influent sewer according to claim 1 , comprising :

a) providing optimum removal efficiencies for chlorinated organics and Adsorbable Organic Halogens (AOX) ;

b) providing optimum removal efficiencies for dioxins , other chlorinated organics , other organics , and achieving average Total Organic Carbon concentration exiting primaryclarifiers less than 65 milligrams per liter ;